

Part 170
Establishment and Discontinuance
Criteria for Airport Traffic Control Tower
Facilities

This edition replaces the existing loose-leaf
Part 170.

This FAA publication of basic Part 170, effective January 3, 1991,
incorporates Amendment 170-1 with preambles.

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the benefits and costs associated with establishing or decommissioning an airport traffic control tower as a part of its mission to maximize safety and efficiency throughout the airport and airway system consistent with available resources. This regulation implements the requirements of recent legislation requiring the publication of criteria for navigational aids and airport traffic control towers. The tower criteria prescribed by this rule will be followed by criteria for other navigational aids as they are developed and revised.

FOR FURTHER INFORMATION CONTACT: Mr. Evan Soffer, Office of Aviation Policy and Plans, Federal Aviation Administration, 800 Independence Ave., SW., Washington, DC 20591; telephone (202) 267-3286.

SUPPLEMENTARY INFORMATION:

Background

The FAA has the responsibility to establish or discontinue airport traffic control towers through the national airspace system when activity levels and safety considerations merit such action. Criteria for the installation of towers have historically been developed by the FAA and its predecessor organization, approved internally within the organization, and published since 1951. Current criteria, including the general qualifications necessary to become a candidate site for establishment or discontinuance of VFR airport traffic control towers, are published in "Airway Planning Standard Number One—Terminal Air Navigation Facilities and Air Traffic Control Services" (FAA Order No. 7031.2C) and detailed in "Establishment and Discontinuance Criteria for Airport Traffic Control Towers." (Report No. FAA-APO-83-2). Decisions to establish and operate airport control towers have been and will continue to be based on benefits exceeding costs of such actions. The Airport and Airway Safety and Capacity Expansion Act of 1987, Pub. L. 100-223, Section 308 (49 U.S.C. 1348), mandated that these criteria be revised and, for the first time, promulgated through Federal administrative regulation.

History

Criteria to establish airport traffic control towers have evolved over time. Initially applied in 1951, a minimum number of operations was required to qualify as a tower candidate. From 1951 through 1974, FAA established minimum qualifying levels of 24,000 annual itinerant operations at air carrier airports, and 50,000 annual itinerant operations at general aviation airports. Differential levels of operations were established under the theory that, at air carrier airports, a better mix of traffic with a wider range of performance characteristics created a greater potential for accidents. In 1975, the criteria were revised to incorporate benefit cost analysis. To qualify for establishment of a tower, the ratio of benefits to costs had to equal or exceed one.

$$\frac{\text{Benefits}}{\text{Costs}} > 1$$

Forming the basis of current criteria, the 1975 criteria considered collision and other accident risk, reduction in flying time, mix of aircraft types, percent of passengers injured, and percent of aircraft damaged.

Criteria for discontinuing tower services have been employed since 1956. In 1977, the first economic-based discontinuance criteria were detailed in a draft report, "An Analysis of Continued Operation of Selected Airport Control Towers." The report provided a comprehensive benefit-cost approach to assess the merits of the continued funding of towers. Locations were identified as candidates for discontinuance whenever benefits from continued tower operation were less than operating and maintenance costs over a 15-year forecast period.

formula equals or exceeds 1:

AC		AT		GAI		GAL		MI		ML		>1
38,000	+	90,000	+	160,000	+	280,000	+	48,000	+	90,000		
A site becomes a candidate for Phase II discontinuance analysis if the ratio sum of the following formula is less than 1:												
AC		AT		GAI		GAL		MI		ML		<1
15,000		40,000		75,000		125,000		20,000		35,000		

where:

AC = Air carrier operations

AT = Air taxi operations

GAI = General aviation itinerant operations

GAL = General aviation local operations

MI = Military itinerant operations

ML = Military local operations

The formula considers activity by user class and differentiates by aircraft size by evaluating air carrier and commuter activity, which are defined in part by aircraft size, in separate classes. Phase II criteria compare the present value of tower benefits with the present value of tower costs over a 15-year period. If the tower meets the initial benefit-cost screening for either establishment or discontinuance, then a site-specific analysis is performed.

The 1983 methodology to calculate benefits and costs for establishment and discontinuance criteria is still in effect today (see Report No. FAA-APO-83-2). Site-specific activity forecasts are used to estimate the benefits resulting from prevented aircraft collisions, from other prevented accidents, and from reduced flying time. Considered in the benefit analysis is the mix of aircraft types—air carrier, air taxi, general aviation, and military—and levels of local and itinerant operating within the terminal area. Also considered are the number of enplaned passengers and crew members who might be fatally or nonfatally injured in a collision or other type of tower-preventable accident. Dollar values are assigned to prevented fatalities, injuries, reduced aircraft operating costs, and time savings for passengers to provide a common basis for comparing benefits and costs.

Recurring tower costs include annual costs of staffing, maintenance, equipment, supplies, and leased services. Establishment costs include nonrecurring investment costs, such as facilities, equipment, and operational startup. Tower discontinuance criteria use the same annual costs as establishment criteria. Discontinuance criteria also consider the costs of closing the tower.

Revised Criteria

As in past criteria, the revised criteria for VFR airport traffic control tower establishment require that candidate airports have life cycle benefits that exceed life-cycle costs.

$$\frac{\text{Present Discounted Value of Benefits}}{\text{Present Discounted Value of Costs}} > 1$$

Criteria for airport control tower discontinuance specify that the present value of benefits derived from continued tower operation compared to the present value cost of continued operation are less than one.

benefits. In addition, the statute requires that the criteria eliminate qualification distinctions based on aircraft size.

Distinctions according to classes of aircraft are eliminated in two ways. First, by eliminating Phase I criteria, the distinction based on aircraft size is removed ("air carrier" and "commuter" service is defined in part by aircraft size). Second, the methodology to calculate benefits contains no reference to aircraft size. Only three functional user groups are used in the benefit-cost calculation: scheduled commercial, nonscheduled commercial, and noncommercial. These user groups have been constructed to reflect differences in the nature of public transport in today's deregulated environment, operating requirements, and sources of data considered helpful in obtaining accurate estimates of potential tower benefits.

The elimination of Phase I criteria reduces confusion regarding the meaning of the formula result. Because of improved automation and the widespread availability of computer equipment, the need no longer exists for the preliminary screening provided by Phase I criteria. Detailed Phase II benefit-cost analysis can now be accomplished quickly and accurately.

Benefit-cost analyses of potential airport traffic control towers are based on two types of benefits (safety and efficiency) and two types of costs (annual and investment). Safety benefits derive from avoiding accidents and their associated fatalities, injuries and property damage. Efficiency benefits derive from the reduction in flying time-saving time of aircraft occupants and reducing variable operating costs of aircraft. Investment costs include the initial costs associated with installing and staffing a new tower. Annual costs are comprised of staffing costs for operation, maintenance, leased communications, and administrative overhead. Discontinuance criteria substitute decommissioning costs for investment costs.

Explicit values assigned to passenger time, life, injuries, aircraft replacement and restoration, and aircraft operating costs provide a basis for comparing benefits to costs across airports. Economic benefits are based on airport-specific aviation activity projected in the FAA's annual Terminal Area Forecasts. Benefits and costs are estimated for a 15-year life cycle and are discounted to their present value using a 10 percent discount rate as directed by the Office of Management and Budget.

How the Criteria Apply

The FAA uses the benefit-cost criteria to determine the eligibility of sites for establishment or discontinuance of VFR airport traffic control tower facilities. A site is eligible for the establishment of a facility or service when the ratio of the benefits to the costs of establishment equals or exceeds 1.0.

A facility or service may be discontinued if the benefits expected to be realized over the remainder of its life cycle fall below its recurring operation, maintenance, and decommissioning costs. Additional factors, such as terrain, weather, operational requirements, or national security, may also be considered in the evaluation of sites as candidates for establishment or decommissioning.

Meeting the economic criteria is usually a necessary condition for facility establishment. However, meeting the criteria is not a guarantee that a tower will be established.

Criteria Results

All nonmilitary airports in the Terminal Area Forecasts were evaluated with the current and revised benefit-cost computer programs for establishment or discontinuance of an airport traffic control tower. Since the FAA issued the notice of proposed rulemaking (NPRM) for establishment and discontinuance criteria for VFR airport traffic control towers (54 FR 22698; May 25, 1989), it has finalized a separate and independent update of various standardized economic values used in FAA investment and regulatory analyses. In addition, aviation activity projections provided by the FAA's Terminal Area Forecasts data base have been updated since the issuance of the NPRM. The criteria and underlying benefit-cost analysis on which this rule is based have been changed to account for differences between the revised draft and final economic values. The FAA believes that the resulting criteria will promote the efficient use of resources while satisfying air traffic control requirements.

This rule is promulgated under the authority of Pub. L. 100-223 which requires the promulgation of regulations to establish criteria for the installation of airport control tower facilities and other navigational aids. The promulgation of this rule satisfies the requirement for airport traffic control tower criteria. Criteria for other navigational aids will be promulgated through future rulemakings as they are developed and revised.

Discussion of Comments

Introduction

Twenty-four parties responded to the NPRM. The comments were categorized as follows: concurrence without comment, site specific concern over the proposed discontinuance criteria, applicability to contract towers, identification of and credit for all benefits, definitional problems, and other comments. The FAA has considered all the comments and has amended the rule and the underlying benefit-cost analysis, where appropriate.

Concurrence Without Comment

Three commenters concurred with the provisions of the proposed rule without further comment. These commenters included the Aircraft Owners and Pilots Association (AOPA), the Air Transport Association of America (ATA), and the Air Line Pilots Association (ALPA).

Site-Specific Concern Over the Proposed Discontinuance Criteria

The most frequent comment pertained to site-specific concerns over the proposed discontinuance criteria. Of the 12 parties that so commented, 10 parties commented specifically on the Joplin Municipal Airport (Joplin, MO), including local officials of Joplin and surrounding communities, the Chamber of Commerce, the airport manager, a fixed-base operator, and a reservation travel service company. The two remaining parties were the airport director of Owensboro-Daviess County Regional Airport (Owensboro, KY) and the Director of Transportation of Jefferson City, MO.

Most of the parties expressing concern over Joplin Municipal vis-a-vis the discontinuance criteria stated that "the FAA plans to close air traffic control towers at smaller airports using arbitrary numbers" and that "such action will jeopardize the growth of business and economic development in the communities served by smaller airports."

In response, the FAA has no general policy or plans to close any specific tower or group of towers. The primary purpose of towers is to enhance the safety of aircraft operations. The FAA believes that the revised criteria will maximize safety for the aviation system as a whole, consistent with the finite resources available to provide air traffic control services. Tower operations will be continued where benefits are demonstrated as outweighing the costs.

The discontinuance criteria require an economic comparison of the safety and efficiency benefits with the net costs of continued tower operation (where net costs include operations and maintenance costs reduced by the termination costs associated with decommissioning or discontinuance). At sites where the benefits fall short of the costs, it is economically sensible to consider termination of tower services and divert these resources to other sites with greater accident prevention and efficiency benefit potential. Conversely, if the benefits outweigh the costs, continued operation of the tower is the preferred action.

While meeting the discontinuance criteria qualifies a site as a discontinuance candidate, decisions to actually discontinue a tower are made on a case-by-case basis. Before a final decision to discontinue a tower is made, the candidate site is subjected to close and highly detailed scrutiny, not only on the basic benefit algorithms within the benefit-cost analysis, but also on the basis of site-peculiar nonquantifiable factors and considerations.

In response, the illustrative costs presented in the benefit-cost analysis report (Report No. FAA-APO-90-7) are based on average costs for FAA-funded and operated towers. The rule itself permits the use of site-specific costs. Hence, notwithstanding the cost illustration, tower costs will differ from case-to-case and are accommodated in the evaluation process. When sites are reviewed and evaluated as candidates for establishment or discontinuance in actual practice and application, site-specific cost data are used in the benefit-cost analysis performed. The cost data would be either actual/estimated FAA costs or the actual/estimated contract costs, as appropriate, and tailored to the extent possible to the site being evaluated.

The objective of the FAA's Contract Tower Program is to continue providing air traffic control (ATC) services at airports with low activity VFR control towers in the most economical manner. This will permit the FAA to make better use of its limited resources, to maintain an efficient network of control towers, and to provide effective and safe service in a cost effective manner. Construction of an airport traffic control tower (ATCT) structure is beyond the scope of the FAA's Contract Tower Program since the contracts are only for the provision of ATC services. The FAA plans to contract for the operation of its Level I VFR control towers as long as continued operation is cost beneficial under a contract operation. Site-specific data, including actual or projected contract costs, are and will be used in each benefits analysis to determine if the ATCT meets criteria for continued operation (i.e., above the discontinuance criteria) or if an ATCT that had been previously closed should be reopened.

The Contract Tower Program also includes a process for the review and consideration of an airport with an operating non-Federal control tower if it meets the criteria for continued operation (i.e., above discontinuance criteria using actual or projected contract costs). Airports that do not have an operating non-Federal ATCT or a control tower structure available for occupancy that meets building standards would not be considered for inclusion in this program. As noted above, construction of an ATCT structure is beyond the scope of the FAA's Contract Tower Program since the contracts are only for the provision of ATC services.

Identification of and Credit for all Benefits

Three parties suggested that not all benefits are addressed by the underlying benefit-cost analysis. In response, and in addition to responses to specific comment outlined below, it should be noted that the rule itself does not specify the exact form of the benefits analysis. The benefit-cost analysis is illustrative and may include other benefit categories on a site-by-site basis.

The general manager of Mizzou Aviation Company, a fixed base operator serving Joplin Municipal Airport, stated that the criteria do not seem to consider growth factors which can be immediate and phenomenal. This commenter also felt that air traffic occurring when the tower is closed had not been considered. In response, this commenter apparently overlooked the fact that the benefit-cost analysis program supporting the tower criteria can and should consider the forecast traffic activity for each and every year of the tower's life cycle. Also, the analysis does account for air traffic activity occurring when the tower is closed.

Among other comments discussed separately below, the airport manager of Paducah Airport Corporation (Paducah, KY) and the airport director of Owensboro-Daviess County Regional Airport (Owensboro, KY) stated that they were unable to determine whether any benefit recognition is given for firefighting, rescue and medical treatment supplies used as the result of an aircraft accident, and Aircraft Rescue and Fire Fighting (ARFF) response to an aircraft accident where there is a control tower to guide ARFF crews to the accident site. In response, although not directly apparent from the recommended benefit-cost approach, averted ARFF expenses are embodied and amortized within the value per life saved used by the analysis in quantifying the value of averted fatalities. ARFF response time, however, is not included in the quantified benefit methodology due to expected variability from site-to-site (e.g., presence of UNICOM, fixed-base operators, population density, etc.). In practice, these benefits may be expressly estimated on a site-specific basis or treated as a nonquantified benefit and acknowledged as such.

on the effects of aviation liability insurance premiums. In response to (1), military aircraft operations are included in the noncommercial functional user category. In response to (2), aviation liability insurance premiums are, in effect, already captured in the benefits methodology by virtue of accounting for expected economic losses of destroyed and damaged aircraft (i.e., aggregate liability insurance premiums simply represent the expected losses to be incurred by the parties insured, ignoring insurance company administrative expenses and profit margins). To further expressly add liability premiums would, therefore, constitute double counting.

In addition to the ARFF and off-airport loss comments, the Paducah airport director had other comments and questions in the category of benefit accountability. He commented that it is unclear what weight nonquantitative factors will bear as compared to quantitative analysis vis-a-vis evaluation of one site against another (e.g., will one airport's runway threshold's line-sight problems be evaluated in the same manner as another's; or what weight will heavily populated property located immediately off the end of a runway have on the level of benefits). He also felt that savings generated by towers in the sequencing of aircraft (which preclude the necessity of flying a traffic pattern) were not accounted for.

In response, nonquantitative factors by nature do not lend themselves to being quantified for across-the-board application. However, because the in-depth benefit-cost analyses are performed at a central location (FAA, Washington Headquarters), treatment of qualitative considerations is relatively consistent from case to case. The benefits generated by towers in minimizing or reducing overflights and traffic pattern flying are addressed in detail in the benefit-cost analysis guide.

Definitional Problems

Definitional problems were cited by the AAAE, the Regional Airline Association (RAA), and the airport manager of Paducah Airport Corporation.

The AAAE recommended a clarification in the Definitions Section of the rule (Subpart A, Section 170.3). To avoid later confusion, the AAAE recommended that the definition of "scheduled commercial service" be changed to read "the carriage by aircraft in air commerce under Parts 121 and 135 of persons or property for compensation or hire based on published flight schedules." In response, the FAA has accepted this definitional comment and has made the corresponding change in the final rule, also including the addition of Part 127.

The RAA asked that if the point of the NPRM was to establish criteria for tower establishment or disestablishment using the three categories of scheduled commercial, nonscheduled commercial, and noncommercial, why are "air carrier," "commuter air carrier," "commuter/air taxi operations," and "air taxi" included in the Definitions Section? In response, the FAA has accepted this comment and deleted the questioned references.

The Paducah airport manager noted that the underlying benefit-cost analysis report states that, at towered airports, data are available on operations classified as scheduled commercial, nonscheduled commercial, and noncommercial traffic. The airport manager pointed out that FAA traffic recording procedures require identification by air carrier, air taxi, itinerant general aviation, itinerant military, local civil, and local military operations. In response, the functional categories of scheduled commercial, nonscheduled commercial, and noncommercial traffic have been constructed and adopted by the revised tower criteria to reflect differences in the nature of public transport in today's deregulated environment, operating requirements, and sources of data considered helpful in obtaining accurate estimates of potential tower benefits. They are not inconsistent, however, with current traffic activity counting and recording procedures. Scheduled commercial operations encompass air carrier and air commuter operations; nonscheduled commercial operations encompass nonscheduled air taxi operations; and noncommercial operations encompass general aviation and military operations.

The Paducah airport manager cited formula references to "the number of user class 'i' aircraft." He concluded that the inference is that the FAA will use broad classes of aircraft data or values which may have no relationship to site-specific flight operations. Use of "averaged" user aircraft classes defeats

seats are classified and counted within the scheduled commercial category. Section 308 of the Airport and Airway Safety and Capacity Expansion Act prohibits the FAA from differentiating between user classes based on aircraft size. The illustrative benefit-cost analysis includes all Parts 121, 127 and 135 operations within the scheduled commercial service functional category. Therefore, this comment is embodied in the recommended benefit-cost analysis procedure.

The Paducah airport manager further stated that lumping military operations with general aviation activity (in the noncommercial traffic category) creates a problem because of differences in their respective sophistication and values. In response, the FAA acknowledges that, as a whole, a military aircraft is significantly different from an average general aviation aircraft. However, military traffic at actual and potential towered civil airports, toward which the criteria are aimed, is not representative of the overall military fleet, but rather is skewed toward smaller aircraft such as trainers, small transports, and rotorcraft.

Other Comments

The RAA believed that the procedures in the underlying benefit-cost report should be spelled out in the published regulations. In response, the benefit-cost analysis is purely illustrative and not hard and fast. Benefit parameters such as forecast activity, value per life saved, costs of injuries, etc., will change over time and the analysis needs to be flexible enough to accommodate unique site benefits. Further, the tower criteria being promulgated under this rule are the first of a number of facilities and equipment establishment and discontinuance criteria which will eventually make up the new Part 170. It is not feasible or reasonable to include the underlying benefits analyses in the Federal Aviation Regulations. Therefore, the FAA will cite the underlying benefit-cost procedures by reference only and make them available on request.

The airport manager of the Enid Woodring Municipal Airport, while acknowledging that the new criteria are a significant improvement over the previous criteria, stated that the "numbers are still unrealistically high . . . for tower candidate airports struggling to reach the magic criteria which will enable them to qualify for a Federal tower." In response, the establishment criteria, among other requirements, are based on an objective economic comparison of benefits and costs to assure that there are net positive benefits from tower establishment or discontinuance.

The Owensboro-Daviess County airport director had several miscellaneous comments. He stated that "there is a strong indication that the entire program is being developed as a means of meeting an end result relating to the Department budgetary concerns." In response, the FAA disagrees with this statement. The criteria are based on an objective assessment of tower benefits and costs and the generally accepted principles of benefit-cost analysis. The criteria are developed completely independent of the budgeting process. The criteria are intended to be a decisionmaking tool and include other considerations in addition to the benefit-cost assessment.

The Owensboro-Daviess airport director also felt that there must be some way of making the evaluation process simpler and that benefit-cost analysis programs involving aviation safety should be outweighed by practicality. In response, the FAA has found benefit-cost analysis to be a useful aid in the investment decisionmaking process, far outweighing the complexities inherent in their development. Once developed, cost benefit analysis programs are easy to apply since they are microcomputer based and capable of accommodating endless sensitivity (or "what-if") analyses.

Regulatory Evaluation Summary

The promulgation of this regulation is expected to have only minimal impact, if any, on the public. Since the new criteria are not expected to result in a significant change in the number of towers being established or discontinued, there is no new cost to the FAA resulting from the application of the revised criteria. As with current criteria, costs to establish an air traffic control tower are not incurred until a site-specific benefit-cost analysis is completed and the resulting benefit-cost ratio equals or exceeds 1. Under this initial screening where benefit-cost ratios are computed using national average costs, 29

Regulatory Flexibility Determination

This rule provides a guide for internal FAA management in the establishment and discontinuance of air traffic control towers; for this reason and for the reasons discussed under "Regulatory Evaluation Summary" above, it is certified that this rule will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

Federalism Implications

The regulation outlined herein will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this regulation does not have Federalism implications warranting the preparation of a Federalism Assessment.

Conclusion

For the reasons discussed above, the FAA certifies that this rule will not have significant economic impact, positive or negative, on a substantial number of small entities, and a regulatory flexibility analysis is not required. In addition, and for the same reasons, the proposal is not major under Executive Order 12291 and is not significant under DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). Since the rule will impose no additional administrative cost on the FAA, the estimated benefits are expected to exceed the estimated costs of implementation.

The Amendment

In consideration of the foregoing, the FAA is adding Part 170 to the Federal Aviation Regulations (14 CFR Part 170) effective January 3, 1991.

Subpart A—General

Sec.

170.1 Scope.

170.3 Definitions.

Subpart B—Airport Traffic Control Tower

Sec.

170.11 Scope.

170.13 Airport Traffic Control Tower (ATCT) Establishment Criteria

170.15 ATCT Discontinuance Criteria.

Authority: 49 U.S.C. 1343, 1346, 1348, 1354(a), 1355, 1401, 1421, 1422 through 1430, 1472(c), 1502, and 1522; 49 U.S.C. 106(g).

SUMMARY: This final rule prescribes benefit-cost based criteria for the establishment and discontinuance of LORAN-C nonprecision approach procedures at airports. Under the criteria, the FAA will consider traffic density, passengers served, and aircraft operation efficiencies along with the cost of establishing and maintaining an approach. The criteria provide a guide to FAA management to assure the cost-effective placement of LORAN-C approaches. This regulation implements the requirements of Public Law (P.L.) 100-223, which requires the publication of criteria for navigational aids and airport traffic control towers.

FOR FURTHER INFORMATION CONTACT: Mr. Frank Emerson, Office of Aviation Policy and Plans (APO-220), Federal Aviation Administration, 800 Independence Avenue, SW., Washington, D.C. 20591; telephone (202) 267-3298.

SUPPLEMENTARY INFORMATION:

Background

The FAA has the responsibility to establish or discontinue LORAN-C non precision approach procedures when activity levels merit such action. The FAA, and its predecessor agency, have been developing, approving, and publishing criteria for approach procedures since 1951. Currently, establishment and discontinuance criteria for certain navigational facilities and control towers are published in an internal FAA document: Airway Planning Standard Number One-Terminal Air Navigation Facilities and Air Traffic Control Services (FAA Order No. 7031.2C, issued November 15, 1984). The existing document does not include the criteria for establishing LORAN-C non precision approaches to runways. The Airport and Airway Safety and Capacity Expansion Act of 1987, P.L. 100-223, section 308 (49 U.S.C. 1348), mandates that certain criteria be promulgated through Federal regulations.

A LORAN-C nonprecision approach procedure is established under FAA Handbook 8260.3B, United States Standard for Terminal Instrument Procedures (TERPS), as amended, which provides guidance for preparation, approval, and promulgation of terminal instrument approach procedures. LORAN-C operates through the low-frequency transmission of timed signals with controlled coded pulses that furnish non precision guidance to pilots with appropriately equipped aircraft. The LORAN-C signal is transmitted by groups of three to six stations, called chains; each chain includes a designated master station and several secondary stations. In a separate rulemaking, the FAA published a new part 170 to the Federal Aviation Regulations (14 CFR part 170) to list the criteria on which it will base its decision to establish or discontinue certain navigation facilities and procedures. On January 3, 1991, the FAA published The Establishment and Discontinuance Criteria for Airport Traffic Control Tower Facilities (56 FR 336). It is anticipated that, in the future, part 170 will include criteria for other kinds of navigation facilities and services. The LORAN-C criteria will be set forth in subpart C of the new part.

The Criteria

New benefit-cost criteria for LORAN-C nonprecision approaches are established by this regulation. The criteria are explained in detail in FAA report number FAA-APO-90-5, Establishment Criteria for LORAN-C Approach Procedures. The criteria for LORAN-C approaches require that, to be eligible for establishment, a candidate runway must meet all FAA standards for non precision approaches and must have life-cycle benefits that exceed life-cycle costs. Discontinuance criteria state that a LORAN-C approach is subject to discontinuance when the present value of its remaining life-cycle benefits falls below the level of the cost of its continued maintenance.

The economic benefit of a LORAN-C approach is improved efficiency associated with a lower approach minimum which permits the runway to remain open at times when weather conditions would otherwise have closed the airport, thereby reducing flight disruptions. A safety benefit for LORAN-C was not included in the benefit-cost analysis because the procedure only enables approaches to be made that weather conditions might otherwise preclude. LORAN-C provides a non precision approach signal that guides a pilot to a specific heading that is in line with a runway. Upon descending to a specified

Explicit dollar values assigned to passenger time and aircraft operating costs provide a basis for comparing benefits to costs. LORAN-C economic benefits are based on future aviation activity projected in FAA's annual Terminal Area Forecast which contains airport-specific forecasts. Benefits and costs are based on a 15-year life cycle and are discounted to their present value using a 7 percent discount rate as directed by the Office of Management and Budget to the 15-year life cycle is the same as that used for most other FAA navigational facilities criteria.

How the Criteria Are Applied

FAA will use the benefit-cost criteria to determine the eligibility of runways for LORAN-C non precision approach procedures. A runway is considered to be eligible for establishment of a LORAN-C approach procedure when the ratio of the benefits to the costs of establishment equals or exceeds 1.0 and all other requirements of the criteria are met. A LORAN-C approach procedure may be discontinued if the benefits expected to be realized over the remainder of its life cycle fall below its recurring maintenance costs.

Meeting the economic criteria is usually a necessary condition to include a site in the FAA budget; however, it is not a guarantee that a site will be funded.

Criteria Results

Runways at 4,078 airports from the Terminal Area Forecast were examined to determine their current benefit-cost (B/C) ratios. Of this universe, at least 1,880, or 46 percent, have one or more runways with a B/C ratio of 1.0 or greater with the remainder falling below the criteria standard. The results show that about three quarters of the airports not qualifying have a B/C ratio below 0.3.

Need for the Regulation

This final rule is issued in compliance with the Airport and Airway Safety and Capacity Expansion Act of 1987, P.L. 100-223 (49 U. S. C. 1348), which requires the promulgation of regulations to establish criteria for the installation of airport control towers and other navigational aids. Its fundamental purpose is to improve the efficiency of FAA resource allocation. Also, the final rule will assist in the establishment of airport and funding priorities.

DISCUSSION OF COMMENTS

Six comments were received in response to the Notice of Proposed Rulemaking (NPRM) Notice No. 92-1 (57 FR 3830, January 31, 1992). Most commenters express support for the development of LORAN-C approaches, stating they will be of particular benefit to rural America and airports without an existing approach.

Use of Benefit-Cost Analysis for Establishing LORAN-C Approaches

Comments: Several commenters disagree with the application of benefit-cost criteria that prevent development of approaches into small, rural communities. One commenter recommends that all airports and heliports meeting the requirements of *United States Standard for Terminal Instrument Procedures* (TERPS) and Part 77 criteria be equally considered. Additionally, if a benefit-cost analysis must be conducted, the commenter advises that a relationship be established that weighs the value of an instrument approach into an airport without an existing approach.

A second commenter claims that the NPRM fails to acknowledge the premise behind efforts devoted to the establishment of LORAN-C approaches. The commenter asserts that the application of strict establishment criteria arbitrarily reduces the number of eligible airports and, therefore, may negate the usefulness of LORAN-C for business and general aviation. Moreover, the commenter alleges that discussion of establishment for LORAN approaches has never been based on the type of consideration listed in Airport

approaches that are expected to result in greater increases in activity. Thus, other factors being held constant, an airport that already has an established approach would be expected to have lower incremental benefits from establishing a LORAN-C approach than would an otherwise-identical airport without an established approach.

The FAA expects relatively little variation among sites in the cost of establishing LORAN-C approaches. Thus, the greatest net benefit (total benefits minus total costs) to the aviation community should be derived by first establishing approaches at those airports having the highest benefit-cost ratios, then proceeding to establish approaches at airports where these ratios are lower. The use of benefit-cost criteria that consider all benefits (including avoided flight delays and benefits to passengers, where applicable) provides a systematic basis for recommending priorities among airports that are candidates for the establishment of LORAN-C approaches.

In view of the current backlog of sites designated for LORAN-C approaches under a cooperative arrangement between FAA and the National Association of State Aviation Officials, the application of establishment criteria is unlikely to either cause or prevent a LORAN-C approach from being installed at an airport in the near term. In addition, as noted in § 170.23(c) of the rule, "the criteria do not cover all situations that may arise and are not used as a sole determinant in denying or granting the establishment of a nonprecision LORAN-C approach for which there is a demonstrated operational or air traffic control requirement."

Application of Establishment Criteria for LORAN-C Approaches

Comments: Some commenters indicate that LORAN-C is a "navigational aid," but not in the sense that it is located on or in the vicinity of the airport/heliport being served, as would be the case for a nondirectional beacon (NDB) or very high frequency omnidirectional range station (VOR). Accordingly, they claim it is unclear from P.L. 100-223 whether "procedure development criteria" fall within this context so that LORAN-C should not be considered in the same category as airport-based facilities. Such classification, in their opinion, makes LORAN-C subject to a "planning standard" which may be a misapplication of P.L. 100-223.

FAA Response: Although LORAN-C installations typically serve wide areas rather than a particular airport, establishment of a LORAN-C approach at a particular airport is conceptually similar to establishment of any other approach. An incremental expenditure is made in order to reap an incremental benefit. For LORAN-C, incremental expenditures consist of the airport-specific costs of establishing and operating the approach. Incremental benefits consist of the airport-specific benefits--over and above those already provided by other aids or by the availability of LORAN-C for en route navigation--that the LORAN-C approach makes possible. The criteria are designed to ensure that the incremental airport-specific benefits exceed or equal incremental costs. Thus, the use of establishment criteria for LORAN-C approaches that are similar to those for other types of non precision approaches is appropriate.

Evaluation of LORAN-C

Comments: Three commenters raise issues pertaining to the evaluation of LORAN-C approaches. One commenter asks whether credit for en route guidance was included in the evaluation of LORAN-C approaches. A second commenter questions the validity of projections contained in the FAA's Terminal Area Forecasts (TAF) publication, alleging that restricting LORAN-C approach evaluations to airports included in FAA Terminal Area Forecasts artificially limits the number of airports considered. Another commenter states that the aviation community considers LORAN-C to be a "valuable navigational [aid]", and disagrees with it being labeled non-precision. The commenter further states that LORAN-C users are kept in an ellipsoid sphere of airspace wherever coverage exists, and that LORAN-C's accuracy is not downgraded or improved based on distance; it stays the same throughout the entire flight from takeoff to landing.

FAA Response: Like VORs and many radar installations, LORAN-C installations provide benefits to aircraft operators both en route and on approach to an airport. However, the final rule and evaluation

Comments: Several commenters mention the FAA's statement that a safety benefit for LORAN-C was not included in the benefit-cost study. Two commenters believe a safety benefit should be included in any benefit-cost study. In addition, one commenter claims that using an approach enhances overall safety even in visual flying rules (VFR) conditions.

FAA Response: A safety benefit for LORAN-C was not included in the benefit-cost analysis. The existence of a LORAN-C approach permits aircraft to make approaches under instrument meteorological conditions with a level of safety equivalent to that under visual conditions. The LORAN-C approach provides a non precision approach signal that guides a pilot to a specific heading that is in line with a runway. Upon descending to a specified altitude, it is then necessary for a pilot to complete the approach and landing visually or to execute a missed approach if the runway is not in sight. Because the descent to the runway must be made visually, the level of safety is considered the same as landing during visual flight rules conditions. Similarly, the level of safety of a LORAN-C approach is considered the same as that of a visual approach in visual meteorological conditions. LORAN-C merely enables an instrument approach to be made that otherwise could not be made at all, rather than make such an approach safer. The intent of this rule is to set guidelines for establishing LORAN-C approaches for operational efficiency. The FAA does not disagree that the existence of an instrument approach may in some cases or situations contribute an element of added safety. The FAA does not deem that contribution to rise to a sufficient level, however, to be included as a quantifiable benefit for the purposes of this rule.

Effects of Lower Costs for Developing and Maintaining Approaches

Comments: Several commenters claim the FAA appears to have not considered the reduced costs for developing approaches using automated technology rather than the current laborious hand method. These commenters suggest that, with ground-based monitors in place to continuously check signal guidance accuracy, the frequency for flight checks could be reduced, resulting in cost savings. Moreover, the current flight inspection criteria for annual inspections may not be necessary; therefore, the possibility of eliminating annual flight check evaluations could be considered. As a result, because of the low cost, many more airports should be eligible.

FAA Response: The criteria is based on a comparison of benefits with costs. Should new technologies lower costs, these newer, lower costs will be used in the benefit-cost evaluations. The result of lower costs, other factors being held constant, will be increased numbers of runways for which the establishment of a LORAN-C approach will have benefits that equal or exceed costs.

Combine LORAN-C and Global Positioning System (GPS)

Comments: Some commenters indicate that the FAA should investigate the possibility that a GPS non-precision approach could overlay a LORAN-C approach, or at least make use of some of the work done in preparing a LORAN-C approach, and that consideration, therefore, should be given to the potential combination of GPS and LORAN-C approaches. Commenters indicate that both GPS and LORAN-C approaches will benefit from an automated approach procedure development capability and from obstacle clearance evaluation. In addition, they argue that once a LORAN-C approach is developed, it also can be used as a GPS approach once the system is operational. In this regard, credit should be taken for cost savings because future costs for establishing GPS approaches will be lowered once LORAN-C approaches are in place.

FAA Response: The possibility of overlaying GPS approaches on LORAN-C approaches is acknowledged and may be considered in future rulemakings on GPS approaches. To the extent that LORAN-C approaches may be used for GPS approaches, thereby resulting in cost savings, the net benefits of approaches that eventually may be designated as LORAN-C/GPS approaches may be raised. However, in the absence of a developed standard for GPS approaches, designating and accounting for benefits of GPS approaches would be premature. When and if appropriate, GPS approach establishment criteria will be pursued.

at the airport/heliport is zero since there is no navigational equipment located there.

FAA Response: The use of 15-year life cycle costs parallels the methodology used for analyzing most other FAA investments subject to establishment/discontinuance criteria, including alternative airport instrument approach aids. FAA utilizes the 15-year life cycle in recognition of both equipment useful life and the potential for technological obsolescence. The FAA recognizes that, where capital investment is involved, it is appropriate to use the expected useful lifetime of the investment as the relevant period for life-cycle cost analysis. In this instance, however, since LORAN-C approaches are relatively new, the FAA does not have sufficient experience-based data to estimate lifetimes for the investments in approaches, but has determined that 15 years represents a reasonable assumption in the absence of such data.

The FAA agrees with the commenter's statement that the actual cost of equipment maintenance at the airport/heliport is zero. Indeed, the Agency's proposed methodology reflects this fact by including only those costs associated with establishing and inspecting the approaches, versus including costs pertaining to airport installed equipment.

Weather Information

Comment: One commenter questions the necessity and usefulness of requiring the availability of weather information and air-to-ground communications.

FAA Response: The weather information and air-to-ground communications requirements for a LORAN-C approach at an airport conform with longstanding requirements for instrument approaches. Weather forecasts are necessary when planning a trip under instrument flight rules (IFR) for determining whether a pilot is required to specify an alternate to the airport of intended landing. To be listed as an alternate, weather information about an airport must also be available. Barometric readings at an airport (or nearby airport) must be available in order for a pilot to set the altimeter to determine when the minimum descent altitude during a non-precision approach to an airport has been reached. This is particularly crucial in view of the fact that a LORAN-C approach minimum descent altitude can be as low as 250 feet.

Federalism Implications

Comment: One commenter believes that the NPRM's Federalism Implications statement is inappropriate because it ignores a long standing partnership between the FAA and State aviation agencies and their representatives.

FAA Response: The FAA is well aware of past and current cooperation with the State aviation agencies and their representatives. This cooperation has been undertaken to accelerate work on the establishment of LORAN-C approaches. The final rule is not intended to interfere with the arrangement to proceed with work on the approaches for airports that have been nominated through the National Association of State Aviation Officials.

Paperwork Reduction Act

There are no reporting or record keeping requirements associated with this final rule.

Regulatory Evaluation Summary

Introduction

The issuance of this final rule is expected to have no direct cost impact on the public. There is only a minimal administrative cost to the FAA of applying the criteria. The FAA uses an automated benefit-cost calculation procedure that provides results at minimal cost. This procedure is embodied in the Aviation Data Analysis (ADA) system maintained by the Office of Aviation Policy and Plans. ADA uses a 15-year forecast of aviation activity, as well as economic and other values, to estimate life-

Regulatory Flexibility Determination

The Regulatory Flexibility Act (RFA) of 1980 was enacted by Congress to ensure that small entities are not unnecessarily and disproportionately burdened by Government regulations. The RFA requires agencies to review rules that may have "a significant economic impact on a substantial number of small entities." This final rule provides a guide for internal FAA management in the establishment and discontinuance of LORAN-C non precision approaches. It is not expected to have any cost impact; therefore, FAA certifies that this final rule will not have a significant economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

Federalism Implications

The regulations herein are not expected to have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this regulation does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Conclusion

Since the regulation contained in this FAA document is expected to impose only a minimal administrative cost on the FAA, the estimated benefits are expected to exceed the estimated costs of their implementation. For the reasons discussed above, this regulation is not expected to have significant economic impact on a substantial number of small entities, and a regulatory flexibility analysis is not required. In addition, for the same reasons, the rule is not "major" under Executive Order 12291 and is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979).

The Amendment

In consideration of the foregoing, the Federal Aviation Administration amends part 170 of the Federal Aviation Regulations (14 CFR part 170) effective September 10, 1993.

Part 170 is revised by adding subpart C consisting of 170.21, 170.23, and 170.25 to read as follows:

Sec.

170.21 Scope.

170.23 LORAN-C Establishment criteria.

170.25 LORAN-C Discontinuance Criteria.

The authority citation for part 170 is revised to read as follows:

Authority: 49 U.S.C. app. 1343, 1346, 1348, 1354(a), 1355, 1401, 1421, 1422 through 1430, 1472(c), 1502, and 1522; 49 U.S.C. 106(g).

This subpart sets forth establishment and discontinuance criteria for navigation aids operated and maintained by the United States.

§ 170.3 Definitions.

For purposes of this subpart—

Aircraft operations means the airborne movement of aircraft in controlled or non-controlled airport terminal areas, and counts at en route fixes or other points where counts can be made. There are two types of operations: local and itinerant.

(1) “Local operations” mean operations performed by aircraft which:

(i) Operate in the local traffic pattern or within sight of the airport;

(ii) Are known to be departing for, or arriving from flight in local practice areas located within a 20-mile radius of the airport; or

(iii) Execute simulated instrument approaches or low passes at the airport.

(2) “Itinerant operations” mean all aircraft operations other than local operations.

Air navigation facility (NAVAID) means any facility used, available for use, or designated for use in the aid of air navigation. Included are landing areas; lights; signaling, radio direction-finding, or radio or other electronic communication; and any other structure or mechanism having a similar purpose of guiding or controlling flight or the landing or takeoff of aircraft.

Air traffic clearance means an authorization by air traffic control for an aircraft to proceed under specified traffic conditions within controlled airspace for the purpose of preventing collision between known aircraft.

Air traffic controller means a person authorized to provide air traffic service, specifically en route and terminal control personnel.

Airport traffic control tower means a terminal facility, which through the use of air/ground communications, visual signaling, and other devices, provides ATC services to airborne aircraft operating in the vicinity of an airport and to aircraft operating on the airport area.

Alternate airport means an airport, specified on a flight plan, to which a flight may proceed when a landing at the point of first intended landing becomes inadvisable.

Approach means the flight path established by the FAA to be used by aircraft landing on a runway.

Approach control facility means a terminal air traffic control facility providing approach control service.

Arrival means any aircraft arriving at an airport.

Benefit-cost ratio means the quotient of the discounted life cycle benefits of an air traffic control service or navigation aid facility (i.e., ATCT) divided by the discounted life cycle costs.

Ceiling means the vertical distance between the ground or water and the lowest layer of clouds or obscuring phenomena that is reported as “broken,” “overcast,” or “obstruction.”

Control tower—See Airport Traffic Control Tower.

Criteria means the standards used by the FAA for the determination of establishment or discontinuance of a service or facility at an airport.

mined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually. It is prescribed and approved for a specific airport by competent authority.

Instrument flight rules (IFR) means rules governing the procedures for conducting flight under instrument meteorological conditions (IMC) instrument flight.

Instrument landing system (ILS) means an instrument landing system whereby the pilot guides his approach to a runway solely by reference to instruments in the cockpit. In some instances, the signals received from the ground can be fed into the automatic pilot for automatically controlled approaches.

Instrument meteorological conditions (IMC) means weather conditions below the minimums prescribed for flight under Visual Flight Rules (VFR).

Instrument operation means an aircraft operation in accordance with an IFR flight plan or an operation where IFR separation between aircraft is provided by a terminal control facility or air route traffic control center (ARTCC).

Life cycle benefits means the value of services provided to aviation users over the life span of a facility or service.

Life cycle costs means the value of research and development costs, investment costs, operation costs, maintenance costs, and termination costs over the life span of a facility or service.

LORAN-C means an electronic navigational system by which hyperbolic lines of position are determined by measuring differences in the time of reception of synchronized pulse signals from two fixed transmitters.

Maintenance costs means the costs incurred in servicing and maintaining a facility after establishment.

Mean sea level (MSL) means the base commonly used in measuring altitudes.

electronic glide slope is available.

Nonscheduled commercial service means the carriage by aircraft in air commerce of persons or property for compensation or hire that are not operated in regularly scheduled service such as charter flights.

Present value (PV) means the value of a stream of future benefits or costs that are discounted to the present.

PVB or BPV means the discounted value of life cycle benefits.

PVC or CPV means the discounted value of life cycle benefits.

PVCM or CMPV means the discounted value of operations and maintenance costs less termination costs over a facility's remaining life cycle.

Runway means a defined rectangular area on a land airport prepared for the landing and takeoff of aircraft along its length.

Runway visual range means an instrumentally derived value based on standard calibrations that represent the horizontal distance a pilot will see down the runway from the approach end.

Scheduled commercial service means the carriage by aircraft in air commerce under Parts 121, 127, and 135 of persons or property for compensation or hire based on published flight schedules.

Separation means the spacing of aircraft in flight and while landing and taking off to achieve their safe and orderly movement.

Takeoff clearance means authorization by an airport traffic control tower for an aircraft to take off.

Tower cab means an ATC facility located at an airport. Controllers at these facilities direct ground traffic, takeoffs, and landings.

Traffic advisories means advisories issued to alert pilots to other known or observed air traffic which may be in such proximity to the position or intended route of flight of their aircraft to warrant attention.

conditions. The term "VFR" is also used in the

facility establishment standards must be met before an airport can qualify for an ATCT:

(1) The airport, whether publicly or privately owned, must be open to and available for use by the public as defined in the Airport and Airway Improvement Act of 1982;

(2) The airport must be recognized by and contained within the National Plan of Integrated Airport Systems;

(3) The airport owners/authorities must have entered into appropriate assurances and covenants to guarantee that the airport will continue in operation for a long enough period to permit the amortization of the ATCT investment;

(4) The FAA must be furnished appropriate land without cost for construction of the ATCT; and

(5) The airport must meet the benefit-cost ratio criteria specified herein utilizing three consecu-

when it satisfies paragraphs (a)(1) through (a)(5) of this section and its benefit-cost ratio equals or exceeds one. As defined in § 170.3 of this part, the benefit-cost ratio is the ratio of the present value of the ATCT life cycle benefits (BPV) to the present value of ATCT life cycle costs (CPV).

$$BPV/CPV > 1.0$$

(c) The satisfaction of all the criteria listed in this section does not guarantee that the airport will receive an ATCT.

§ 170.15 ATCT Discontinuance criteria.

An ATCT will be subject to discontinuance when the continued operation and maintenance costs less termination costs (CMPV) of the ATCT exceed the present value of its remaining lifecycle benefits (BPV):

$$BPV/CMPV < 1.0$$

must be met before a runway can be eligible for a LORAN-C approach.

(1) A runway must have landing surfaces judged adequate by the FAA to accommodate aircraft expected to use the approach and meet all FAA-required airport design criteria for non-precision runways.

(2) A runway must be found acceptable for instrument flight rules operations as a result of an airport airspace analysis conducted in accordance with the current FAA regulations and provisions.

(3) The LORAN-C signal must be of sufficient quality and accuracy to pass an FAA flight inspection.

(4) It must be possible to remove, mark, or light all approach obstacles in accordance with FAA marking and lighting provisions.

(5) Appropriate weather information must be available.

(6) Air-to-ground communications must be available at the initial approach fix minimum altitude and at the missed approach altitude.

value of LORAN-C life-cycle costs (PVC):

$$\text{PVB/PVC} \geq 1.0$$

(c) The criteria do not cover all situations that may arise and are not used as a sole determinant in denying or granting the establishment of a non-precision LORAN-C approach for which there is a demonstrated operational or air traffic control requirement.

§ 170.25 LORAN-C Discontinuance Criteria.

A LORAN-C nonprecision approach may be subject to discontinuance when the present value of the continued maintenance costs (PVCM) of the LORAN-C approach exceed the present value of its remaining life-cycle benefits (PVB):

$$\text{PVB/PVCM} < 1.0.]$$

[(Amdt. 170-1, Eff. 9/10/93)]

